Part 512 – Construction

Subpart A – General Information

AL512.0 Introduction

When a job design is complete and ready for contracting, the state office engineering section (SOES) will assemble the following:

a. Original construction drawings.
b. Specifications.
c. Independent government estimate (IGE).
d. Bid schedule.
e. Performance time computations and schedule of operations.
f. Prepare AD-700 (Procurement Request) with resource program manager (RPM) and budget officer's signature.
g. Operation and Maintenance Plan.
h. Design folder.
i. Quality Assurance Plan

The SOES will forward the completed items (a.) through (g.) to the contracting officer (CO) for contracting. A courtesy copy of the transmittal letter will be sent to the appropriate assistant state conservationist for field operations (ASTC-FO), district conservationist (DC), resource engineer (RE), and the RPM. A minimum of five copies of (a.) and one copy of (b.) and (h.) will be sent to the RE either as hard copies or electronic copies.

The CO will obtain the required bid prints of the construction drawings from the SOES, prepare the necessary contract documents, and assemble the bid packages. The CO will provide the SOES and RE with a minimum of 5 copies of the completed bid packages either hard copies or electronic copies.

The CO will schedule the date of the site showing and proposal due date after consulting with the RE and the engineers serving as the state construction engineer for suitable dates.

The government representative (GR) and/or contracting officer's technical representative (COTR) will be appointed by the CO based on the recommendations in the approved inspection plan. Inspection personnel will also be appointed per the recommendations of the inspection plan.

Copies of the letters of appointments for the GR/COTR and Quality Assurance Inspector (QAI) will be distributed as follows:

- 1 copy to the personnel folder of the employee,
- 1 copy to the contract file,
- 1 copy to the state conservation engineer (SCE),
- 1 copy to the ASTC-FO,
- 1 copy to the employee's supervisor,
- 1 copy to the contractor awarded the bid.

On complex jobs or in situations where the GR/COTR and/or CI have limited experience, a pre-bid conference will be scheduled by the construction engineer prior to the site showing. The conference will be attended by the design engineer (DE) and/or the RE in charge of the design, the engineer serving as the state construction engineer, GR/COTR, and the CI.

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Subpart B – Preconstruction Activities

AL512.13 Preconstruction Conference

After the award of a contract, the government representative/contracting officer's technical representative (GR/COTR) will request a pre-construction conference be scheduled by the contracting officer (CO) for all major jobs and for any minor jobs as determined by the GR/COTR to be needed. The conference should be attended by the GR/COTR, construction inspector (CI), CO, and the contractor or their representative(s). On complex jobs, the conference should also include attendance of the state conservation engineer (SCE) or the engineer serving as the state construction engineer. Others to be included could be the contractor's superintendent, project manager, and safety officer, as well as the sponsor or landowner.

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Subpart C – Evaluation of Construction Materials

AL512.21 Evaluation Procedures

B. Where used materials are allowed in conservation practices, the material shall be examined to determine if it meets or exceeds the minimum material quality, design life, and performance criteria as specified in the appropriate Field Office Technical Guide (FOTG) practice standard or Construction Specification. Prior to installing used materials, the quality, performance, and design life of used materials must be documented in writing as meeting or exceeding the requirements as specified. The determination shall be made by a person with appropriate engineering job approval authority.

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Subpart D – Quality Assurance Activities

AL512.32 QA Procedures

A. It is the policy of the NRCS in Alabama, regardless of program, to provide the degree of quality assurance required to ensure acceptable results in each element of construction work by providing continuous or periodic construction inspection as outlined in 512.32 of this part.

1. Non-Contract Work (Private Contracts or FA). The person responsible for the design of the job will be responsible for determining the degree of inspection and the elements to be inspected within their engineering job approval authority. The resource engineer (RE) in consultation with the Assistant State Conservationist for Field Operations ASTC(FO) will determine the degree of inspection required for all engineering job classes above the approval authority of the field office employee. The SCE will review and approve the quality assurance plan for all engineering job classes above the engineering job approval authority of the RE.
2. Formal Contracts (Federal and Contracting Local Organization)
   a. The designer will identify in the project design report those job elements and employee qualifications necessary for proper inspection of job elements. Inspector assignments will be based on the qualifications identified in the design report for the job. Normally, one inspector will be assigned to a construction contract. Other inspectors may be detailed to assist as needed on a temporary basis.
   b. It is important that inspectors be on the job only during the time when actually needed and overtime should be held to a minimum commensurate with job inspection requirements. Prior to charging overtime, permission shall be approved in writing (memo, email) by the appropriate line officer. It will be the responsibility of the contracting officer's technical representative (COTR) to keep in close touch with daily construction operations on each contract and provide guidance to the inspector(s) assigned to the job. If an emergency arises during the day which changes the situation, it will be the responsibility of the inspector to determine if continuous or periodic inspection is required and act accordingly. The rationale for making the change should be recorded in the inspector's next daily report.
   c. A quality assurance plan (QAP) is required for all proposed work identified in project agreements. Elements to be included in the QAP are listed in 512.31.C. QAPs will be included in the design report and/or design folder for each formal contract. A copy of the QAP will be forwarded to the SCE, ASTC(FO), and the contracting officer.
   d. A pre-final inspection will be held for all formal contracts when the contractor has substantially completed the work under the terms of the contract. The purpose of the pre-final inspection is to determine if the technical provisions of the contract are in compliance and identify any items of work remaining to be completed. NRCS personnel involved in a pre-final inspection would normally include the contracting officer's technical representative (COTR), construction inspector (CI), and district conservationist (DC). The COTR will notify the contracting officer (CO) and all other personnel involved, in as many days in advance as possible, prior to the date desired to hold a pre-final inspection. After consulting with those to be involved, the COTR will establish the final date and time of the pre-final inspection and make appropriate notifications. The COTR will document the results of the pre-final inspection on Form NRCS-AS-805, "Check List Prior to Final Inspection." Copies will be furnished to the CO and SCE. The COTR will inform the contractor and the CO on the results of the inspection.

e. A final inspection will be held for formal contracts when the contractor has completed the work under the terms of the contract. The final inspection is for the purpose of determining if the contractor has fulfilled his/her contractual obligation and can be relieved of the project. Personnel involved in a final inspection normally includes the CO, COTR, SCE or state construction engineer, CI, DC, ASTC(FO), and the sponsors. The COTR will notify the CO, COTR, SCE, CI, DC, ASTC(FO), and the sponsors, in as many days in advance as possible, of the desired date to hold the final inspection. In some instances, it may be determined before or at the pre-final inspection. Results of the final inspection shall be recorded by the COTR on Form NRCS-ADS-45, "Final Inspection and Certification of Completion." If the SCE is not available for the final inspection, the COTR or state construction engineer, shall sign the final inspection form as acting SCE. Copies of the final inspection shall be furnished to the CO and SCE. At an appropriate time during the final inspection, the DC shall review the operation and maintenance plan with the sponsors.

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Subpart E – Equipment, Records, and Coordination

AL512.40 Engineering Equipment

A. Minimum engineering equipment needs. Each field office and resource engineer's office shall have the necessary equipment to ensure quality assurance on installation of conservation practices. Equipment needs will vary greatly between field offices due to workloads and type of practices installed. The assistant state conservationists for field operations with the assistance of the resource engineer (RE) shall develop a list of equipment needs for each field office in their administrative areas. Equipment needs for resource engineers' offices shall be determined by the RE.

The following is intended to provide a minimum list of equipment from which to add or delete for each office.

Minimum Equipment Needs for Field Offices

Surveying instrument preferably self-leveling or laser
GPS unit
Surveying rod
Clinometer
Engineering chain or tape (100 or 200 feet)
Hand level
Measuring wheel
Measuring tape - 12 and/or 25 feet
Calculator

Minimum Equipment Needs for Resource Engineers' Offices

Total station surveying instrument
Survey Grade GPS
Surveying instrument preferably self-leveling or laser.
Surveying rod
Range pole
Clinometer
Engineering chain or tape (100 or 200 feet)
Hand level
Measuring wheel
Measuring tape 12 and/or 25 feet
Calculator
Slump cone
Concrete thermometer
GPS unit
Bulk Density Sampler
Electronic Scales

B. Each office is responsible to determine when additional equipment is needed to ensure quality assurance of conservation practices installed within their area of responsibility and to request the equipment in a timely manner through appropriate channels.

Equipment shall be checked in accordance with NEM 544.3.

AL512.41 Records

B. Photographs. The RE will be responsible for photographic coverage on all construction contracts under their supervision. The RE may have other employees such as inspectors take the photographs. Photographs shall be properly recorded on Form AL-ADS-20 and in the job diary.

The resource engineer will see that enough photographs are obtained to document contractual activities for legal purposes, such as photographs of:

Normal working conditions and construction methods.
Poor working conditions and construction methods.
Inferior work.
Improper utilization of equipment, etc.

Exhibit 1 can be used as a checklist for types of photographic documentation needed.

These photographs will become a part of the ENGINEERING, Construction Records case files for each construction contract.

The documentary photographs should be correlated with detailed events logged in the job diary. Form AL-ADS-20, Index of Documentary Construction Photographs, will be used for this cross reference.

Photographs will be cataloged. This cataloging will consist of:

1. Numbering each photo - A systematic method of identifying the photo with the job will be used. Example: Pictures taken on Site No. 11, Hurricane Creek Watershed should be labeled 2013-11-1, 2013-11-2, etc. In addition, the numbering should coincide with the daily sequence in which taken as reflected by the master control.
2. Posting the number of photo to Form No. AL-ADS-20 on the corresponding line showing date and description.
3. Placing printed photos, CD or DVD in an appropriate construction folder showing:
   a. Name of watershed.
   b. Site number.
   c. Inclusive dates of photo coverage.
   d. Inclusive numbers of photos contained therein.

Upon completion of construction, ALL photos will be transferred along with the rest of the ENGINEERING case file to the SCE within 90 days. The SCE will review these photos making any copies needed for the permanent files. The original photos will remain a part of the permanent "as-built" file.

AL512.42 Coordination Between Disciplines

A. Construction contract modifications. For contract modifications requiring the immediate attention and technical concurrence of the state conservation engineer (SCE), the responsible engineer shall

inform the SCE and the contracting officer (CO) regarding the nature of the needed change and the estimated cost. Upon technical concurrence of the change, the responsible engineer will inform the CO of the details on the proposed modification and furnish detailed information required to prepare the modification. The CO will obtain funding approval from the appropriate program manager before proceeding with the modification. The CO will advise the responsible engineer whether or not to proceed with the modification. Modified work shall not proceed before the CO approves the modification. Modifications not requiring immediate attention will be prepared by the responsible engineer and forwarded through normal channels to the CO.

Contract modifications involving major changes to the construction plan drawings or require additional construction plan drawings, shall be reviewed and approved (signed plans) by the SCE.

Part 512 – Construction

Subpart E – Equipment, Records, and Coordination

AL512.41 Exhibit 1. Documentary Photograph Procedures

1. Before construction - Take photographs that will show condition before work commences. Use reference points in each photo that will also appear in follow-up photographs.

2. Site Preparation. Photographs of:
   a. Any easement limitations that were violated during site preparation.
   b. Improper methods of stripping and disposal of material.

3. Clearing and Grubbing. At least one photo will be taken during these operations to show methods of operation. One photo will be taken after each operation is completed to show that the area has been completed in accordance with specifications.

4. Conduits. Sufficient photos will be taken to show:
   a. Foundation conditions before conduit is placed.
   b. Type and condition of bedding or cradle for pipe conduits.
   c. Condition of damaged conduit pipe and of repair.
   d. Location and condition of anti-seep collars.
   e. Back-fill around conduit.
   f. Type of pipe joint and brand of pipe used. One typical joint after the pipe has been placed. This might be shown in same photo as anti-seep collar photo.
   g. Any unusual conduits, such as beveled or curved pipe installation.
   h. Any leaks evident while conduit pipe is being tested.

5. Structure Drainage. At least one photo to indicate the extent and to verify the location, type, and placement of filter material and filter drain pipes.

6. Concrete. Sufficient photos to indicate:
   a. Proper forming.
   b. Steel placement.
   c. Honeycombed areas, if any, and repair.
   d. Placement.
   e. Methods of attaching guard rail, trash rack, slide headgates, etc.
   f. Curing procedures.
   g. Methods of testing.

7. Earth Fill. Sufficient photos to indicate:
   a. Equipment conditions.
   b. Methods of operations, such as discs or scarifying equipment, water wagons, compactors, scrapers, etc.
   c. Placement and shape of lifts.
   d. Operation that might affect the efficiency of the operation.
   e. Methods of testing.

8. Rock Riprap
   a. Condition of foundation prior to rock placement.
   b. Placement of filter cloth and/or bedding.
   c. Placement of riprap.
   d. Placement of riprap grout, if used.
   e. Completed work.

9. Gates and Valves
   a. Completed gate assembly in the closed and open position.
   b. Completed gate, stem, and hoist assembly.

10. Channel Improvement. This type of work includes all types of channel improvement work, such as clearing and snagging, stump spray, and all types of channel excavation. Photos will be taken during construction to show:
   a. Equipment at work.
   b. Placement of spoil.
   c. Objectionable material covered with spoil.
   d. Sloughed channel banks.
   e. Rock strata.
   f. Changed conditions such as weak bank soils.
   g. Side inlet after installation.

11. Safety. Photos will be taken of all unsafe construction operations that could endanger public life or property whenever or wherever they occur during construction operations. Follow-up photos must be taken to document the corrected conditions.

12. Critical Area Treatment. When critical area treatment is applied, photos will be made of the following:
   a. Area before treatment.
   b. Method of treatment.
   c. Area showing completed treatment.
   d. Photos of other items will be covered as previously discussed.

There are other important items not covered by this listing but this information should give the photographer a general idea of the type coverage required.

Thorough coverage should be made of any condition which would significantly affect the cost of performing a bid item. Change or unexpected conditions should be well covered.

Any violation of the contract that can be documented with photos should be done during or immediately after it occurs.

Photographs should be taken with a reference object in this picture to give a scale of dimensions.

AL512.41 Exhibit 2 – Index of Documentary Construction Photographs

AL-AS-9
9/69

U.S. Department of Agriculture
Natural Resources Conservation Service

INDEX OF DOCUMENTARY CONSTRUCTION PHOTOGRAPHS

_____ Watershed - Site No. _____

Or _____ Channel Improvement

Date	Time	Photographer	Condition Description	Job Diary (Page and Book No.)	Photo No.

Part 512 – Construction

Subpart F – As-Builts

AL512.50 General

All construction records, design data, "as-built" drawings, and other pertinent data shall be transmitted to the state conservation engineer as soon as possible, but not later than 90 days after acceptance of the project work.

"As-built" drawings should be prepared on black line drawings. The following is a list of items which are to be recorded in the "as-built" drawings: (Record Items 1 through 14 on Sheet 1 when possible, Record Items 1 through 8 on all projects).

1. Name of contractor
2. Contract number
3. Date of contract
4. Project agreement number
5. Date construction started
6. Date construction completed
7. Name of Government Representative or COTR
8. Name of Construction Inspector
9 Hazard class: _____ Height of dam _____ ft.
10. Volume of embankment: _____ cu.yds.
11. Emergency spillway: Type _____ width _____ ft. Depth _____ ft. Total capacity _____ cfs
12. Low stage capacity _____ acres
13. High state capacity _____ acres
14. Construction cost: $_____ Federal
    $ _____ Local
15. Name of pipe manufacturer, number of joints, length of each joint of pipe, length of wall fitting, actual three-edge bearing strength, and other pertinent data.
16. List of the joint gap and invert elevation at each joint along the principal spillway.
17. Location, elevation, and description of concrete markers (minimum of two) set during construction for temporary benchmarks and permanent monuments. One should also be set on the outlet structure or support bent.
18. All contract modifications by number, date, and brief description.

For recording details that represent the structures as it was actually constructed, use the following procedures:

1. To record major changes, plot as-constructed <u>cross-section</u> on the following sections: embankment, principal spillway, emergency spillway, keyway, conduit trench, and diversions.
2. To record major changes, plot as-constructed <u>profiles</u> of the following: emergency spillway, structure conduit trench, cut-off trench, outlet channel, foundation drain, and other as required.
3. Note all changes in measurements, elevations, quantities, and other details by lining through the existing data and inserting the correct date above or below.
4. In the legend show the standard symbols which were used to indicate the "as-constructed" details, or show "as-constructed" in the appropriate place on the plans.

In preparing "as-built" plans for <u>channel jobs</u>, use all items above which apply and, in addition, show natural drains, spoil openings, all pipe and drop inlets, maintenance crossings, cattle crossings, drop structures, mitigation measures, and other pertinent data. The "as-built" profile will be based on checked sections at intervals of 500 feet or less. Show the location of all public utilities, such as bridges, pipelines, buried telephone cables, etc., by reference to channel centerline station number and elevation.

Reference the centerline station of the channel as constructed to landmarks such as property lines, fences, and fixed improvements so that the centerline stations can be re-established if necessary.

AL512.53 - Disposition

The original "as-built" plans for inclusion in the completed case file will be transmitted to the SCE. Copies of the as-builts will be made in the state office and transmitted to the ASTC(FO) for distribution.

The United States Forest Service, Tennessee Valley Authority, or Corps of Engineers are to be provided a copy of the as-builts if the structure is located on property under their jurisdiction.

A copy of the original will be filed in the "as-built" files in the state office engineering section.